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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/817,592

**Applicant(s)**

HARTKOP ET AL.

**Examiner**

Audrey Y. Chang

**Art Unit**

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-52 and 57-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-52 and 57-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

#### ***Remark***

- This Office Action is in response to applicant's amendment filed on June 6, 2008, which has been entered into the file.
- By this amendment, the applicant has amended claims 1, 16, 21, 42, 57, 68, and 76.
- Claims 1-52, and 57-81 remain pending in this application.

#### ***Response to Amendment***

1. The amendment filed on June 6, 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: claims 1, 21, 42, 57, 68 and 76 have been amended to include the phrase "open apertures scan the aperture plate in two-dimensional movements". The specification fails to give EXPLICIT teachings concerning the two dimensional movements of the open apertures.

Applicant is required to cancel the new matter in the reply to this Office Action.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 1-52 and 57-81 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added matters are set forth in the section “response to amendment” stated above.

4. **Claims 1-53 and 57-81 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach by simply having an aperture plate with apertures scanning the aperture plate is capable of providing three dimensional image display. As clearly indicated in paragraph [0060] of the instant application, an associated perspective view of an 3D object or scene needed to be displayed on the display screen in synchronizing manner with the each scanning location of the aperture to allow three dimensional illusion of the object be viewed. The claimed three dimensional image display is therefore not enabling by simply having the aperture plate with aperture scanning the plate.

The specification also fails to teach that the multiple different perspectives form perceived 3D images simultaneously viewable from respective multiple different user viewing angles. The specification only teaches that a **single** perceived 3D image is formed by essentially simultaneously viewed by from respective multiple different user viewing angles, (i.e. a fast scanning of the aperture with a fast frame rate of the displaying of the corresponding perspective image to provide the essential simultaneously viewing of the multiple different perspectives of the 3D object). The “3D” image is a perception formed within the viewer's mind or brain, it is not a real physical image.

Claim 76 recites the phrase “a hybrid screen” but the specification fails how a hybrid screen is formed. **The applicant is respectfully noted that no explicit teachings concerning the hybrid screen is given in the specification.**

**The applicant is respectfully noted that simply having moving aperture WILL NOT give three dimensional image display. The scanning of the aperture MUSY be associated with according perspective of view of a 3D object to allow three dimensional image display.**

*Claim Objections*

**5. Claims 1-52 and 57-81 objected to because of the following informalities:**

(1). The **amended** phrase “the open apertures scan the aperture plate (or the flat screen Ferroelectric LCD dynamic parallax barrier) in two dimensional movements to generate illusion that the opaque areas are transparent” recited in **amended** claims 1, 21, 42, 57, 68 and 76 is confusing. Perhaps it is better to state as “the apertures are sequentially open to form scanning apertures across the aperture plate (or the flat screen Ferroelectric LCD parallax barrier) to generate illusion that the opaque areas are also transparent”.

(2). **Claims 1, 21, 42, 57, 68 and 76 have been amended** to include the phrase “provides multiple different perspectives of a scene that form perceived 3D images”. This is confusing and wrong since the multiple perspectives of a scene would form a single perceived 3D image not plural images. It is also not clear what is the relationship between the “scene” and the “3D object”. It is not clear if they are the same or not?

(3). The phrase “control system controlling *sequencing* of said display screen and said aperture plate to produce three-dimensional images” as recited in claim 2 is confusing and wrong. **Firstly**, there is no “sequencing” of the display screen that can be controlled. **Secondly**, what exactly is the “*sequencing*” is being controlled here? **Thirdly**, control “sequencing” **WILL NOT** provide three-dimensional images. The image frame for certain perspectives and locations intended for viewing can be sequentially displayed on the screen and location of the apertures on the aperture plate can be controlled in synchronization with the image frame displayed to achieved three dimensional viewing. Furthermore, it is not clear what is

Art Unit: 2872

considered to be these "image portions" and how are they related to the "3D" perceived image or the multiple different perspectives ?

(4) The aperture plate may have apertures on the plates but will not "produce" slit apertures. The amended term "**capable of**" recited in claim 5 is confusing and indefinite since it is not clear if the phrase after the term is or is not part of the claim. **The applicant is respectfully noted that the recitation regarding the ability of the element is not part of positive limitations of the claims. The phrase is better stated as "apertures of said aperture plate form vertical slit aperture openings each having a slit width".**

(5). The phrase "a solid state scan type" and "a solid state type" recited in various claims is confusing since it is not clear what are these **types**. The applicant is respectfully noted the word "type" is like the word "like" that is indefinite.

(6). The phrase "a hybrid screen" recited in claim 76 and its dependent claims is confusing and indefinite since it is not clear what does it means by the term "hybrid"? **The applicant is respectfully note that a hybrid projection system is different from a hybrid screen.**

(7). The phrase "capable of" recited in various claims is confusing and indefinite. It has been held the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

**Appropriate correction is required.**

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**7. Claims 1-2, 5-18, 20, 21-23, 26-32, 34-41, 42-44, 46-52, 68-75, and 76-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Just et al (PN. 6,674,463) in view of the patent issued to Bacs (PN. 5,678,089).**

Just et al teaches an *autostereoscopic image device* that is comprised of *an display screen* (Figures 9-11), having pixels and pixels width, (please see Figure 10), and a *shutter* serves as the *aperture plate* having apertures and opaque areas formed by closed apertures between open apertures that is disposed in front of the display screen. Just et al teaches that the display screen displays *multiple different perspectives* of a 3D object or 3D scene (Figures 8 and 10). Just et al teaches that the open aperture moves *sufficiently fast* over (or scans over) the screen so that the movement of the open aperture is *no longer resolved* (i.e. the illusion that the opaque areas are also transparent) by an observer and the different perspective images displayed on the screen merge into a three-dimensional perception of the 3D object, (please see column 2, lines 49-60). The different perspective images is images of a scene of a 3D object such that the multiple perspectives form a perceived 3D image.

This reference has met all the limitations of the claims. This reference teaches that the different multiple perspectives (such as B-2 to B2, Figure 10) is simultaneously viewable with the synchronization opening of the apertures forms a single perceived 3D image but it does not teach to form multiple 3D images as claimed. However it is not possible for the multiple perspectives to form multiple perceived 3D images. This feature therefore cannot be examined further.

Just et al teaches that there is a gap separation, *d*, (Figure 9), between the display screen and the aperture plate. Just teaches that for certain design the gap distance can be 3.5 cm, (please see column 12, line 43), which is between 0.1 cm and 5 cm.

**Claims 1, 21, 42, 68 and 76 have been amended** to include the phrase that the “open apertures scan the aperture plate in two dimensional movements to generated illusion that that opaque areas are

Art Unit: 2872

transparent". Just et al teaches that the open aperture moves *sufficiently fast* over (or scans over) the screen so that the movement of the open aperture is *no longer resolved* (i.e. the illusion that the opaque areas are also transparent) by an observer, (please see column 2, lines 50-60). Just et al demonstrates in the figures that aperture moves in a one dimensional or horizontal direction to accommodate only for the observer to observe change with horizontal parallax, (please see column 6, lines 65-67). However Just et al also teaches that it is straight-forward modification to *generalize* the horizontal parallax case to arbitrary observation positions, (please see column 7, lines 1-4). This means the single aperture technique can be modified and generalized to provide for instance full parallax, i.e. also includes vertical parallax for allowing more positions for observation. One skilled in the art must understand in order to provide also vertical parallax, the aperture must allow to be opened without resolution along the vertical direction also. Bacs et al in the same field of endeavor teaches an autostereoscopic imaging apparatus that utilizes single aperture technique wherein the single aperture (30) scans through vertical parallax positions. The vertical parallax positions are the positions allow the aperture to move in two-dimensional manner, (please see Figures 1-3, 10a-10c). It would then have been obvious to modify the autostereoscopic image display apparatus of Just et al to allow the single aperture also scans or opens in two dimensional movement to allow both horizontal and vertical parallax viewing.

**With regard to independent claim 42**, Just et al teaches that the shutter or the aperture plate may comprise ferroelectric liquid crystal display as dynamic parallax barrier, (please see column 2, lines 39-42 and column 16, lines 9-10).

**With regard to independent claim 68**, Just et al teaches that the display screen can be a LCD panels, which is a flat panel, and the aperture plate is comprised of a ferroelectric liquid crystal display device, which is also has a flat panel. Just et al teaches that there is a gap separation,  $d$ , (Figure 9), between the display screen and the aperture plate. Just teaches that for certain design the gap distance can be 3.5 cm, (please see column 12, line 43), which is between 0.1 cm and 5 cm.

**With regard to independent claim 76,** Just et al teaches that the display screen can be a LCD panels, which is a flat panel, and the aperture plate is comprised of a ferroelectric liquid crystal display device, which is also has a flat panel. Just et al teaches that there is a gap separation,  $d$ , (Figure 9), between the display screen and the aperture plate. Just teaches that for certain design the gap distance can be 3.5 cm, (please see column 12, line 43), which is between 0.1 cm and 5 cm. This reference does not teach explicitly that the display screen is a hybrid screen. But it is not clear what does it mean by a "hybrid screen" such feature really cannot be examined with details.

With regard to claim 2, Just et al teaches that the display of sub-images (or image portions) of width  $D$  is synchronized with the opening of the apertures (with aperture width  $s$  as shown in Figure 9), this means certain control means is needed that connects both the display screen and the aperture plate to provide the synchronization operation, (please see column 5, lines 32-43).

With regard to claim 5, Just et al teaches that the aperture has a finite width that implicitly makes it a slit with certain vertical dimension.

With regard to claims 6-8, and 22, Just et al teaches that the pixel width (corresponding to the width for each perspective) can be equal to the slit width, (please see column 12, lines 60-67, wherein the actual pixel width for each perspective is 0.5/12 mm and the slit width is also 0.5/12 mm). Although it does not teach explicitly the slit width may also greater than the pixel width, such modification is considered to be obvious matters of design choice to one skilled in the art since it achieves the same three dimensional image display. The aperture plate has predetermined number of apertures and the number of apertures is less than the number of the pixels.

With regard to claim 9, Just et al teaches that the aperture plate is comprised of a ferroelectric liquid crystal display that implicitly include active regions for form the apertures.

With regard to claims 10-13, 31-32, 34, 44, 47-48, and 70-71, Just et al teaches that the image display fresh rate is determined by the multiplication of the standard flicker free rate (50 to 70 Hz) and the

Art Unit: 2872

number of the required perspective views, (please See column 3, lines 46-52), which is well above 150 Hz (or frames per second). Just et al also teaches the frame rate is several thousands hertz which is less than 20,000 Hz or frames per second. Just et al teaches that it is possible to have one perspective per one degrees of viewing angle which is more that 8 different perspectives. Just et al teaches that for a typical notebook computer, the number of perspectives is 12, (please see column 12, lines 60-67). Since the moving of the aperture is synchronized with the displaying or fresh rate of the display screen, the aperture plate is also a high speed shuttering system. Furthermore, the ferroelectric liquid crystal display is a high speed shuttering system.

With regard to claims 14 and 35, Just et al teaches that the display screen could be a liquid crystal display (LCD, please see column 13, line 31).

With regard to claims 15-16,36-37 and 77 the display is a rear projection display device, (please see Figures 9-10). This reference does not teach the display is either a high speed projector or a DLP, however since both display devices are well known in the art it would have been obvious to one skilled in the art to utilize either one of the display for the benefit of making them also capable of providing three-dimensional image display. With regard to claim 77, it is an obvious modification for one skilled in the art to include a video projector with the display screen to provide the image information for displaying.

With regard to claims 17-18, 20, 38-40, and 46, Just et al teaches that the aperture plate is comprised of a ferroelectric liquid crystal display. It however does not teach it could also be a "scan type aperture plate" included flat or curved scanner. However since the specification fails to teach what is considered to be the "scan-type aperture plate" such features cannot be examined with details. But if they are well known type aperture plate and performs the same function as the ferroelectric liquid crystal display then it would have been obvious design choices to one skilled in the art to use one or the other aperture plate for they achieve the same function.

With regard to claims 23, and 43, Just et al teaches that there is a gap separation, d, (Figure 9), between the display screen and the aperture plate. Just teaches that for certain design the gap distance can be 3.5 cm, (please see column 12, line 43), which is between 0.1 cm and 5 cm.

With regard to claim 26, Just et al teaches that the physical dimension of the aperture plate can be smaller than the physical dimension of the screen, (please see Figure 9 and column 12 for the design specifics).

With regard to claims 27-30, 41, 49-52, 72-75 and 78-81, the viewing angle range certainly includes 10 to 30 degrees horizontally and can be up to 180 degrees, (please see column 3, lines 45-55). For the vertical parallax, it is implicitly implied by the aperture the same way as the instant application.

**8. Claims 3, 4, 19, 24, 25, 33, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Just et al and Bacs et al as applied to claims 1, 21, and 42 above, and further in view of the patent issued to Taniguchi et al (PN. 6,094,216).**

The autostereoscopic image display device taught by Just et al in combination with the teachings of Bacs et al as described for claims 1, 21 and 42 above has met all the limitations of the claims.

With regard to claims 3-4 and 24-25, Just et al teaches that the aperture plate and the display screen is separated with a gap of finite distance “d”. However it does not teach explicitly if the gap is formed as an air gap or solid gap. Taniguchi et al in the same field of endeavor teaches a aperture plate disposed in front of a display screen wherein the gap between the aperture plate and the display screen can be either formed as air gap, (please see Figure 9) or solid spacer (102, Figure 34, column 1, line 45). It would then have been obvious to one skilled in the art to apply the teachings of Taniguchi et al to either use an air gap or a solid spacer to facilitate the separation between the aperture plate and the display screen.

With regard to claims 19, 33 and 45, Just et al teaches that the display screen could be a liquid crystal display but it does not teach explicitly that it is a ferroelectric liquid crystal display device. Taniguchi et al in the same field of endeavor teaches that a ferroelectric liquid crystal display device is a well known display device, (please see column 7, line 51). It would then have been obvious to one skilled in the art to apply the teachings of Taniguchi et al to use a ferroelectric liquid display device as alternative display device as an obvious matters of design choice for both LCD and ferroelectric LCD function the same as image display screen.

**9. Claims 57-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Just et al (PN. 6,674,463) in vie of the patents issued to Baes et al and Taniguchi et al.**

Just et al teaches a autostereoscopic image device that is comprised of a *display screen* (Figures 9-11), having pixels and pixels width, (please see Figure 10), and a *shutter* serves as the parallax barrier having *apertures* and opaque areas formed by closed apertures between open apertures that is disposed in front of the display screen. Just et al teaches that the display screen displays *multiple different perspectives* of a 3D object or 3D scene (Figures 8 and 10). Just et al teaches that the open aperture moves *sufficiently fast* over (or scans over) the screen so that the movement of the open aperture is *no longer resolved* (i.e. the illusion that the opaque areas are also transparent) by an observer and the different perspective images displayed on the screen merge into a three-dimensional perception of the 3D object, (please see column 2, lines 49-60).

This reference has met all the limitations of the claims. This reference teaches that the different multiple perspectives (such as B-2 to B2, Figure 10) is simultaneously viewable with the synchronization opening of the apertures forms a single perceived 3D image but it does not teach to form multiple 3D images as claimed. However it is not possible for the multiple perspectives to form multiple perceived 3D images. This feature therefore cannot be examined further.

**Claim 57 has been amended** to include the phrase that the “open apertures scan the aperture plate in two dimensional movements to generated illusion that that opaque areas are transparent”. Just et al teaches that the open aperture moves *sufficiently fast* over (or scans over) the screen so that the movement of the open aperture is *no longer resolved* (i.e. the illusion that the opaque areas are also transparent) by an observer, (please see column 2, lines 50-60). Just et al demonstrates in the figures that aperture moves in a one dimensional or horizontal direction to accommodate only for the observer to observe change with horizontal parallax, (please see column 6, lines 65-67). However Just et al also teaches that it is straight-forward modification to *generalize* the horizontal parallax case to arbitrary observation positions, (please see column 7, lines 1-4). This means the single aperture technique can be modified and generalized to provide for instance full parallax, i.e. also includes vertical parallax for allowing more positions for observation. One skilled in the art must understand in order to provide also vertical parallax, the aperture must allow to be opened without resolution along the vertical direction also. Bacs et al in the same field of endeavor teaches an autostereoscopic imaging apparatus that utilizes single aperture technique wherein the single aperture (30) scans through vertical parallax positions. The vertical parallax positions are the positions allow the aperture to move in two-dimensional manner, (please see Figures 1-3, 10a-10c). It would then have been obvious to modify the autostereoscopic image display apparatus of Just et al to allow the single aperture also scans or opens in two dimensional movement to allow both horizontal and vertical parallax viewing.

Just et al teaches that the shutter or the aperture plate may comprise *ferroelectric liquid crystal display* as dynamic parallax barrier, which is a flat screen device, (please see column 2, lines 39-42 and column 16, lines 9-10). Just et al also teaches that the display screen could be a liquid crystal display but it does not teach explicitly that it is a ferroelectric liquid crystal display device. Taniguchi et al in the same field of endeavor teaches that a ferroelectric liquid crystal display device is a well known display

Art Unit: 2872

device, (please see column 7, line 51). It would then have been obvious to one skilled in the art to apply the teachings of Taniguchi et al to use a ferroelectric liquid display device as alternative display device as an obvious matters of design choice for both LCD and ferroelectric LCD function the same as image display screen.

Just et al further teaches that there is a gap separation, d, (Figure 9), between the display screen and the aperture plate. But it does not teach explicitly that there is a substrate between the display screen and the dynamic parallax barrier. Taniguchi et al in the same field of endeavor teaches a parallax barrier (103, Figure 34) and a display screen (101) is placed at opposite side a substrate (102) serves as the spacer between the two. It would then have been obvious to one skilled in the art to apply the teachings of Taniguchi et al to modify the device of Just et al to make the display screen and the aperture or parallax barrier plate at opposite side of the substrate for the benefit of using the substrate as the spacer to provide the required spatial separation between the two.

With regard to claim 58, Just teaches that for certain design the gap distance can be 3.5 cm, (please see column 12, line 43), which is between 0.1 cm and 5 cm.

With regard to claim 59, it is implicitly true that the LCD display displays the image with pixels having pixel width. Just et al teaches that for certain design the aperture having an aperture width equal to the pixel width, (please see column 12, lines 64-67).

With regard to claim 60, both Just et al and Taniguchi et al teach that the image display may be color image display, (please see column 13, lines 30-32 of Just et al and Figure 30 of Taniguchi et al).

With regard to claims 62-63, Just et al teaches that the image display fresh rate is determined by the multiplication of the standard flicker free rate (50 to 70 Hz) and the number of the required perspective views, (please See column 3, lines 46-52), which is well above 150 Hz (or frames per second). Just et al also teaches the frame rate is several thousands hertz which is less than 20,000 Hz or frames per second.

With regard to claims 64-67, Just et al teaches that the viewing angle range certainly includes 10 to 30 degrees horizontally and can be up to 180 degrees, (please see column 3, lines 45-55). For the vertical parallax, it is implicitly implied by the aperture the same way as the instant application.

***Response to Arguments***

10. Applicant's arguments with respect to claims 1-53 and 57-81 have been considered but are moot in view of the new ground(s) of rejection. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

11. Applicant's arguments are mainly drawn to newly amended features in the claims and they have been fully addressed in the reasons for rejection set forth above.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (9:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Audrey Y. Chang, Ph.D.*  
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